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Ecological Perspectives of Urban Green and Open Spaces
Ökologische Perspektiven von Stadtgrün und Freiraum

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Urban nature perception in socio-economic different urban neighbourhoods in Germany, Chile and Spain

Jürgen H. Breuste¹, Carlos Priego², Jorge Rojas³

Abstract

Cities are not socially homogenous, but divided into socially and structurally differentiated sub-units. Likewise, the individuals of a community, city or neighbourhood present specific behavioural patterns and uses with respect to their public green areas. This premise has led us to explore the question of how the perceptions, uses, and behaviours of people from different countries, cultures, and socioeconomic levels differ or coincide as far as urban nature and landscapes are concerned. With this aim, an international cooperative project was undertaken between Chile, Germany and Spain in order to study the perceptions and valorisations that people of different social statuses and in different cities hold regarding nature. Due to the comparative nature of the project, research areas with similar characteristics were chosen, thus allowing a comparative analysis of upper and lower middle-class neighbourhoods in German, Spanish and Chilean cities. People from all six study areas were surveyed using the same questionnaires. The results revealed that people of different social and cultural backgrounds use and perceive urban landscape in different ways. We found that nature plays an important role in all the urban societies and particularly in the neighbourhoods studied, regardless of social status or nationality. However, the higher the social status, the greater the urban green area dedicated to private uses. All urban dwellers use different kinds of nature in their cities. The preference for specific types of nature depends not only on social status, but cultural elements, accessibility and tradition as well. Moreover, nature-related outdoor activities are defined by this status, in turn reflecting the individual's cultural status within society. We conclude that if urban landscapes are to satisfy urban dwellers' need to be in contact with nature, they must include urban green as an important element in order to fulfil that need. Indeed, this aspect should be reflected in a much clearer and straightforward manner in urban planning strategies if we are to achieve liveable cities and urban landscapes that people can enjoy.

Key words: Urban green, perception of nature, urban nature, urban neighbourhoods

1. Urban green - nature in cities

Urban growth has profoundly transformed the landscape in recent decades, significantly affecting the ecological systems of which it consists and created the urban landscape as special landscape type (SUKOPP and WERNER, 1983; McDONNELL et al, 1997; BREUSTE and WOHLLEBER, 1998; BAKER et al, 2001). Although cities have traditionally been perceived as an aggression against the environment and they can have a profound impact on adjacent ecosystems (DOUGLAS, 1983), much can be learned and remedied by applying concepts of biodiversity to urban ecosystems (SAVARD et al. 2000). As evidence suggests, people exposed to nature in their daily lives heighten their awareness of

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environmental problems. It is therefore important to enhance the biodiversity of urban ecosystems reflecting the perception of different parts of it by the urban population (SEBBA, 1991, ROHDE and KENDLE 1994).

Much effort has been made at the international level to preserve nature, particularly in relatively intact environments with rich biodiversity or species in danger of extinction. However, these efforts have bypassed the importance of urban nature close to where people live and work (CHIESURA, 2004). This neglect is reflected in the fact that many city governments have cut expenditures for the development, management and maintenance of green space (TYRVAJINEN and VAANANEN, 1998).

It is an undeniable fact, however, that green areas and urban parks are parts of urban nature and keys to improve the quality of life in an increasingly urbanised society. Quality of life is understood as the interaction between each of the environmental conditions in which people live (air, water contamination, type of housing, etc.) and other attributes that are intrinsic to the individual's personal welfare (health, education, etc.) (PACIONE, 1982; HILLS, 1995; BENZEVAL et al., 1995). The pursuit for well-being - reflected in the growing interest in urban nature - has awakened in ecologists, biologists, geographers and sociologists, among others, an environmental awareness on the importance of "urban green space" and given rise to a vast amount of research on the environmental (AKBARI et al., 1992; SANTIBÁÑEZ and URIBE, 1993; NOWAK et al., 2000; MACDONALD, 1996; MCPHERSON et al., 1995; PECK and CALLAGHAN, 1999), economic (ANDERSON and CORDELL, 1988; SELIA and ANDERSON, 1982, 1984; MCPHERSON, 1991), and social (KUO and SULLIVAN, 1999, 2001; BRUNSON et al., 1998a, 2001; DWYER et al., 1992; JACOBS, 1961; ULRICH, 1984; KAPLAN, 1993; CHENOWETH and GOBSTER, 1990) benefits that these green areas provide. However, the majority of the research in this field has been carried out in developed of "the north", especially in Western, Northern and Central Europe. There is much less known about the conditions in "the south". The geographic, economic and cultural context has an important influence on the relation of the people with nature and landscape and this can be accepted to find also in urban landscapes.

HOUGH (1989) argues that exposure to nature in one's place of residence or at holiday destinations is vital to developing environmental awareness. Moreover, work in direct contact with nature is a great source of satisfaction for those who do it (MILES et al., 1998).

Trees and plants as landscape elements clearly play an important role in attracting residents of a neighbourhood to its public spaces and serve to strengthen common interests and create social ties among them (LEWIS, 1992). This opportunity for social contact is supported by the studies of LEWIS, 1996; BERMAN, 1997; BRUNSON et al., 1998b. These authors demonstrated how neighbourhoods with naturalization plans in which residents worked and organised together, came to know one another better, permitting them to develop a sense of unity and gratification for what they were doing. Similarly Kuo et al., 1998^a found that in public spaces with a greater amount of vegetation, social ties among visitors were stronger than among citizens who lived far from urban green spaces. Yet social cohesion cannot be fully achieved unless the community uses, enjoys, creates and participates in these urban green spaces (HESTER, 1984).

Throughout the last decade, many cities have incorporated activities in their environmental programmes to put citizens in closer contact with nature. These activities are designed to increase citizens' sense of social identity and provide psychological benefits to the residents who participate in them (MILES et al., 1998; ULRICH, 1976). In this way, citizens become aware that by actively working and participating alongside others, they can change and control the conditions of their own environment (DWYER, 1995; KUO et al., 1998b).

According to PARK (1915), the city is not a socially homogeneous set or unit, but is divided into a series of differentiated social subunits. In a broad sense, this differentiation depends on the lifestyles and particular characteristics that define the different social groups and the place these groups occupy in the urban social stratum (JON, 1989).

Although individuals of a given community, district or neighbourhood use and behave towards public green spaces in a similar way, these behavioural patterns may vary between towns, cities and even countries with different economic, social and educational backgrounds.

Increasingly greater attention has been given to the sustainable development of cities. However, sustainability is no longer viewed simply as a question of improving the biotic or abiotic aspects of a city, but also involves the study of the social features of city life. These include citizens' level of satisfaction as well as their experiences, behaviours and perceptions with regard to the quality of the environment in which they live (BEER 1994). In the framework of this research, the interaction between urban nature and sustainability is approached through the study of how urban nature provides a source of social amenities which are essential to citizens' quality of life (PRESCOTT-ALLEN 1991).

2. Research targets

The point of departure for this research is the hypothesis that people's perceptions, uses and behaviours regarding the landscape and urban natural spaces in general and different landscape elements in particular are conditioned by their socio-economic and educational background. In order to confirm this hypothesis, an empirical study was conducted in three completely different countries: Germany, Chile and Spain.

Similar sites were selected for study in the three countries. These included the Silberhöhe and Paulusviertel neighbourhoods in the city of Halle (Saale), Germany; the Tumbes community in the town of Talcahuano and the community of Villa San Pedro in the town of San Pedro de la Paz, Chile (Conurbation Concepcion-Talcahuano); and El Brillante and Santa Marina neighbourhoods in Cordova, Spain.

Questions such as "How is urban nature understood by those who do not have access to it?", "Does nature have the same importance for the rich and the poor (under different circumstances)?", "How and when is urban nature used and perceived by different communities or neighbourhoods within a city or in different cultures and countries?", were the departure point for a common research project of scientists of the selected countries⁴.

3. Methodology

3.1 Selection of research sites

For the empirical, social and scientific study, and with the aim of examining the behaviour towards and exploitation and use of natural resources in sites representing a range of architectural styles and social groups, settlement structures were chosen in countries with different cultural and developmental models. Germany and Spain were selected as two examples of developed countries with large socio-economic and cultural differences, while Chile was chosen to represent a developing country. Selection was based on a criterion of convergence between the existence of and access to urban nature by citizens from different social segments.

The residential sites of each country were chosen according to the following criteria:

The research areas (urban neighbourhoods) of each country are located in the same city to ensure that they were influenced by the same local and regional culture.

All of the research areas have a high population density, and social and economic differences regarding settlement structure and standard of living. One area represents a middle-high social standard area, the other a low social standard area.

All of the cities have settlement structures that can also be found in other cities with similar characteristics (typology).

One of the two neighbourhoods in each city has clearly poorer internal natural conditions than the other in terms of both quality and quantity.

All residents of both neighbourhoods in each city have easy access to an urban park (nature type 1).

The neighbourhoods are located in outlying districts (at a maximum distance of 10 to 15 minutes) with practically intact nature-near areas (urban wildernesses) (nature type 2).

In Chile, Laguna Chica and Laguna Grande are the urban wilderness areas corresponding to San Pedro de la Paz, while the wilderness area corresponding to Talcahuano is Tumbes Park. In Germany, the Paulusviertel and Silberhöhe neighbourhoods of the city of Halle-Salle were chosen for study. Galgenberg nature area constitutes the natural green area corresponding to the neighbourhood of Paulusviertel, while the Weisse Elster and Saale meadows correspond to the neighbourhood of Silberhöhe. For the city of Cordova, Spain the neighbourhood of Santa Marina corresponds to Colon Park and the Brillante neighbourhood corresponds to the Sierra Morena Mountains.

Halle (Saale) is an important old industrial city located in the new federal states of Germany. In this city the large housing development of Silberhöhe and the residential neighbourhood of Paulusviertel were chosen for study. In Chile the agglomeration of Tumbes/Talcahuano and some urban sectors of the city of San Pedro de la Paz were selected. Both of these areas are located in the conurbations of the city of Concepción, the capital of the VIII Region of Chile. Declared a World Heritage City by the UNESCO, Cordova, Spain is famous for its historical architecture; a legacy of the different civilizations that have settled in the city over the centuries. The neighbourhoods selected in Cordova include Santa Marina, which is located in the historical city centre, and El Brillante, a residential area experiencing rapid growth.

Each of the study sites is characterised by a particular architectural style and marked socio-economic differences. The high-income settlement structures or “residential communities” studied were the historical district of Paulusviertel (Germany), San Pedro de la Paz (Chile) and El Brillante (Spain). The low-income or “working-class” communities included Silberhöhe (Germany), Tumbes (Chile) and Santa Marina (Spain). These urban areas were intentionally chosen to represent completely different architectural structures with a view to demonstrating the impact of the residential environment on the perception and use of natural resources.

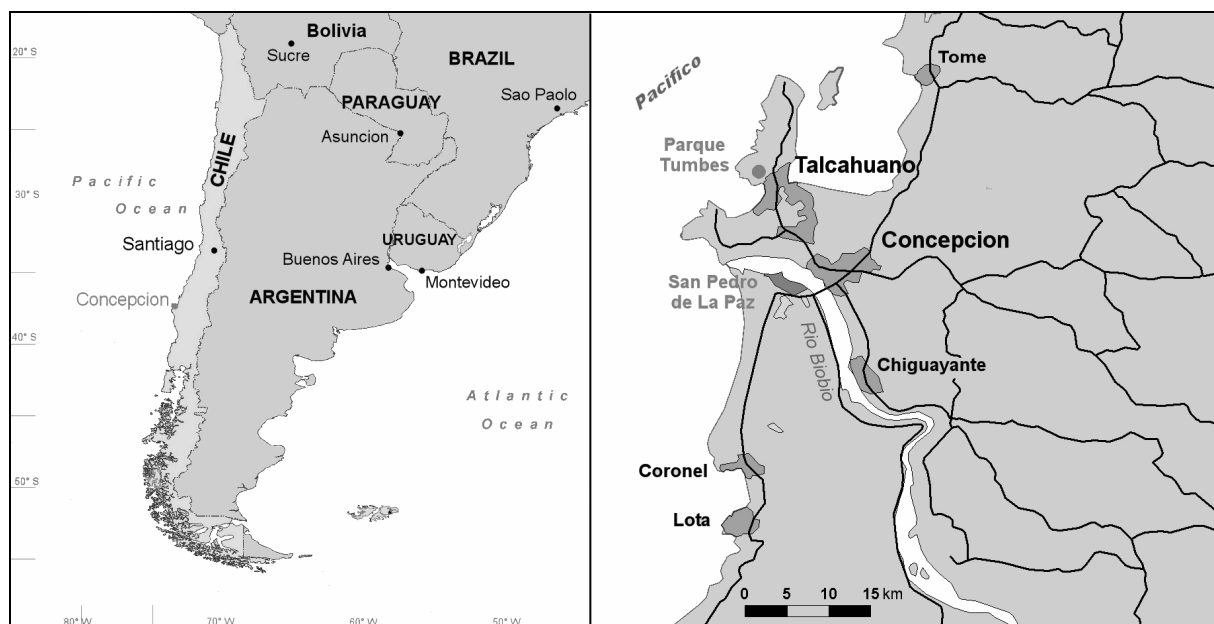


Fig. 1: Latin America, Chile and Concepción Study sites

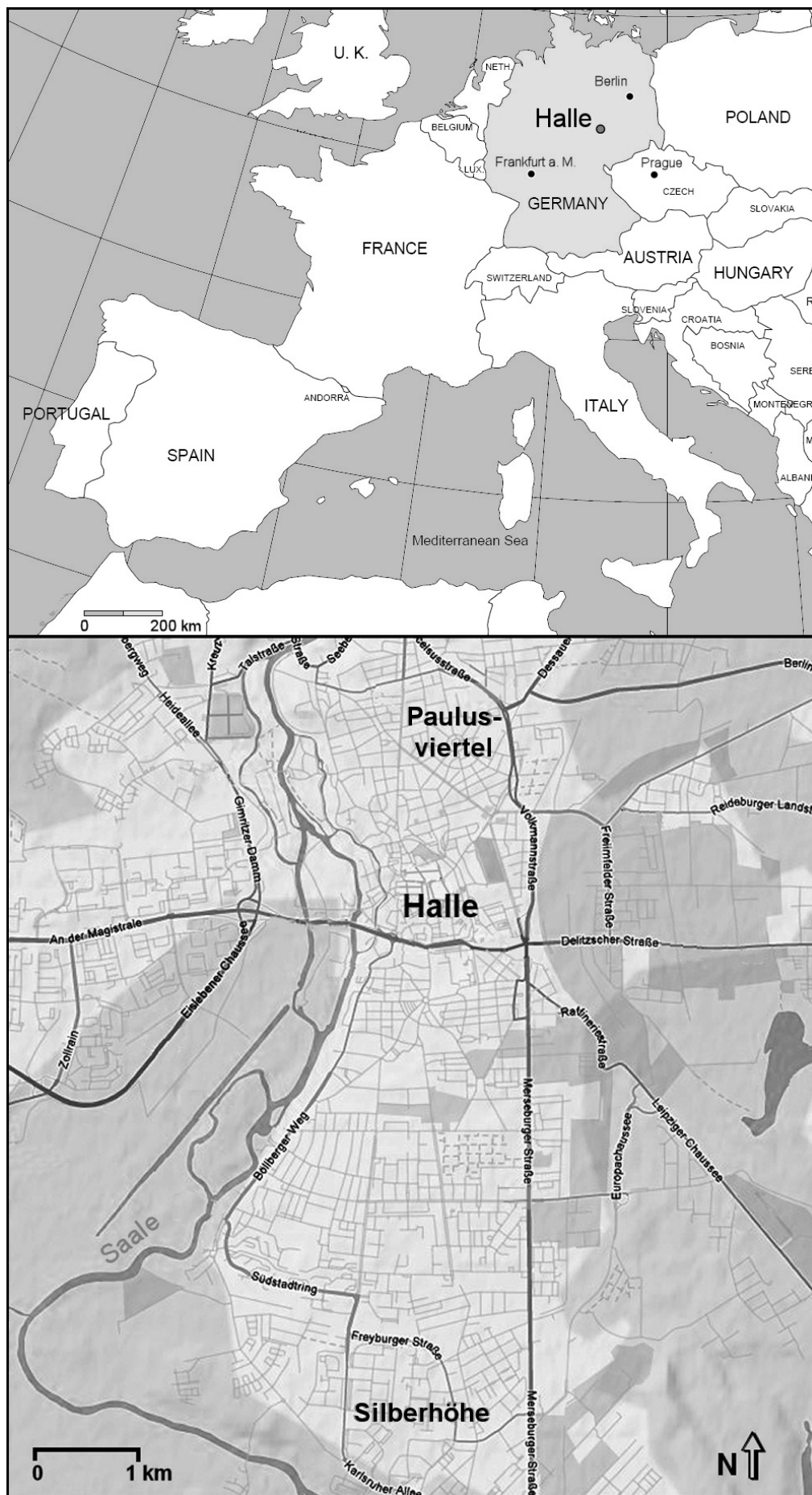


Fig. 2: Germany, Halle. Silberhöhe and Paulusviertel neighbourhoods

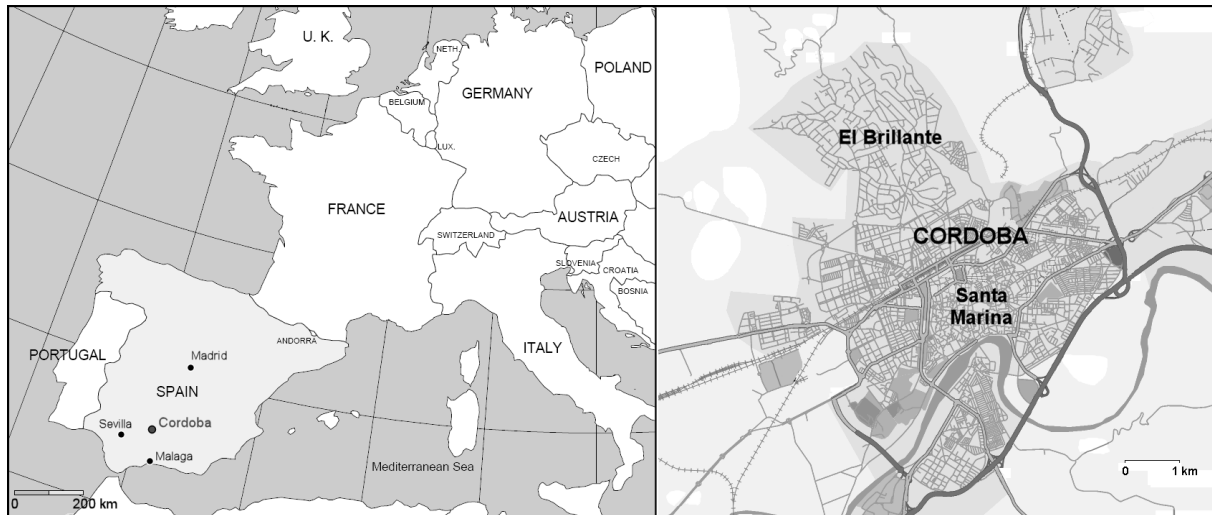


Fig. 3: Cordoba with study areas El Brillante and Santa Marina

3.2 Characterisation of study areas

Halle/Saale, Germany: The *Paulus neighbourhood (middle-high social standard area)* is a residential district located in the historical and contains typical dwellings with different building conditions and building density. It was largely built from 1900 to 1930 and is mostly made up of blocks of flats, small buildings on the periphery (4-storey rental units dating from 1900 to 1914), villas and old residences that are rented by the upper middle-class. Approximately 8,600 inhabitants reside in the study area, making it the most highly populated sector inside the city. Paulusviertel has a population density of 82 inhabitants per hectare (1995), second only to the sectors with large housing developments. Nonetheless, the number of inhabitants and the population density are in decline.



Fig. 4: Rathenau Square



Fig. 5: Paulus Neighbourhood

The *Silberhöhe housing development (low social standard area)*, 35,000 inhabitants, is located in the south of the city and is the most recent construction of the GDR (1978-1989). With a population density of 74 inhabitants per hectare, Silberhöhe is the mostly densely populated neighbourhood in Halle. Although there are numerous open spaces, they are insufficient given the high population density and not very functional. The green spaces include relatively large lawns, grass roadside verges and a few green areas with trees. The survey was conducted in the 8 WK (GDR-time prefabricated housing estates) housing development. Built in the eighties, this is one of the most recent developments of its kind.

A green corridor covers only a few hectares, the park barely satisfies the needs of the neighbourhood residents. It has lawn areas and bushes, is crossed by a pathway and is equipped with a playground. Adjacent to the housing development there are extensive flood plain meadows along the Weisse Elster and Saale rivers. This is a mostly uncultivated landscape that is of easy access for urban wilderness

recreation. The meadow is chiefly composed of perennials on wasteland, small cultivated surfaces and woodlands and forms part of the Saale Valley protected landscape. Owing to the variety and wealth of bird species that can be found here, it is particularly good for observing nature.



Figure 6: Silberhöhe Neighbourhood



Figure 7: Green Corridor in Silberhöhe Neighbourhood

Conurbation Concepción-Talcahuano, Chile: The town of *San Pedro de la Paz (middle-high social standard area)* originally belonged to the city of Concepción until its independence in 1995. The town currently has 80,284 inhabitants (2002 Census) and is 99.4% urbanised. The town is chiefly residential and commercial and oriented to the services industry. The residents in this sector are, on the whole, median income professionals, teachers, public service employees, independent workers, shopkeepers and retirees. The large residential communities are located close to natural resources and areas of high ecological value which fulfil important urban functions. The most notable of these are Laguna Chica, Laguna Grande, the lake basins and the Los Batros wetlands. The lagoon basins have forest plantations, remnant native brush land and new housing developments. Private residences and clubs, public spas, sports facilities and other buildings can be found on the margins of the lagoons and have modified the coastline.



Fig.8: San Pedro de la Paz neighbourhood



Fig. 9: Laguna Grande

Talcahuano is considered the most important military, industrial, fishing and commercial port in Chile. The study area is located in census districts No. 5 and No. 8. The entire area is known as Tumbes (low-income area). The neighbourhoods studied include Los Copihues, Nueva Los Lobos, Bandarán and Centinela Sur with a total population of some 12,000 inhabitants. The area is comprised of multi-storey blocks of flats which were built in the eighties and nineties. These settlements are of recent construction and characterised by their high population density (300 - 500 inhabitants per ha.). The concentration of a low-income population constitutes a serious problem as it leads to social conflict and has an adverse affect on the green areas, including Tumbes Park. The majority of the working population of Talcahuano is engaged in activities connected to the informal sector of the economy and lack stable, well-paid

employment. Due to their low educational level and lack of skills, the residents in this area cannot aspire to better jobs. Ninety per cent of the people of Talcahuano live in houses, many of which are small, shanty-like structures (7.2%). These dwellings measure 34 m² in size and are built out of light materials (wood and sheet metal) on 70m² plots of land, leading to overcrowding and social conflict. The area lacks community facilities and green spaces. Tumbes Park is the natural urban wilderness nearest the residential sector. It consists of woodlands, open grass tableland and rough coastline.



Fig. 10: Port of San Vicente. Talcahuano



Fig. 11: Tumbes Park

Cordova, Spain: *El Brillante (middle-high class area)*, covering a total of 560 hectares, is the most extensive residential district in the city. The enormous growth the neighbourhood has undergone in recent decades can be explained by the pursuit for new modern lifestyles and the desire to escape from degraded urban environments with a high population density and deficient services; features which characterise the traditional neighbourhoods of Cordova. This lack of urban planning has prevented the creation of a unified landscape that is integrated into its natural environment (García, 1993). The population of El Brillante has grown exponentially from 2,010 inhabitants in 1960 to 10,879 in 2003 (Municipal Census). In spite of this growth, El Brillante continues to have the lowest density (10 inhabitants per ha.) and youngest population in Cordova. Although 73% of the population is between 15 and 65 years of age, the majority is under 50. The neighbourhood residents are chiefly middle-class liberal professionals, civil servants and trained or business professionals. Given the individualistic and possession-oriented cultural models of this sector of the population, the residents tend to have a more private vision regarding green spaces and access to and enjoyment of nature. The neighbourhood is known as the “green lung” of Cordova. The largest public green space is the “Circuito del Tablero” or Tablero Track, which is mainly used for sports. However, the park is not adapted for use by pedestrians as it lacks rest areas or playgrounds. Due to its location in the foothills of the Sierra Morena mountain range, much natural urban wildlife can be found in the areas surrounding El Brillante; areas with native vegetation and patches of reforestation that can be observed from any point of the neighbourhood. The entire area is currently protected by the PGOU, the General Plan for the Regulation of Urban Areas.



Fig. 12: View of El Brillante



Fig. 13: View of Sierra Morena

Santa Marina (working class area) is one of the most traditional neighbourhoods in Cordova. Located in the core of the most easterly part of the historical district of the city, Santa Marina contains many buildings and spaces that are an important element of the city's architectural and cultural heritage. Built during the Islamic period and the early Middle Ages, Santa Marina lacks in a structured urban plan. The neighbourhood is comprised of a complex network of narrow, winding streets which occasionally open out onto small squares. Although most of the houses are built following a similar architectural style, a large number of homes or public housing developments for the working classes can be found alongside palatial homes in which the wealthier sectors of the city live (García, 1993). While most of the dwellings have courtyards, their function in the lower-income dwellings is not aesthetic but social, creating common ties and providing a space in which residents can carry out household-related tasks. Although the population of Santa Marina has risen slightly in recent years (from 4,671 inhabitants in 1996 to 4,676 in 2003), the population growth in the neighbourhood remains practically at a standstill today. Little over 22% of the population is under 20, while the large elderly population (16.46% of the population is over 65) is growing. The urban features of this neighbourhood such as the lack of space and social services (hospitals, centres for adult education, green spaces, etc.) has led many of its residents to migrate to other areas of the city that are currently experiencing growth. Santa Marina has ten public squares of varying sizes, all of which are of diverse origin and designed in the traditional manner. The majority of these squares are not fit for the recreational needs of the local residents. Colon Park is the green area that is closest to the Santa Marina neighbourhood. It is equipped with a variety of amenities for recreational use such as large trees, benches, dog parks and playgrounds.



Fig. 14: View of historical quarter



Fig. 15: Street in Santa Marina

3.3 Design and implementation of survey

For the survey design, the social criteria that best represent the aims of this study were selected, namely those having to do with the interactions of different socio-economic classes with nature such as “Quality of Life”, “Community and Local Identity” and “Recreational Activities” (s. Tab. 1).

The survey consisted by interviews with distributed questionnaires of selected samples of the population of all the 6 research areas in the 3 cities. The questionnaires included closed questions of the following areas:

1. Free time activities.
2. General interactions with nature, behaviour towards nature, daily perception and assessment of nature.
3. Nature in the residential environment.
4. Observation of nature.
5. Use of nature and natural amenities in the residential area and in the city in general: Type of nature, reasons for use, amount of time spent in nature, and aesthetic assessments of nature.
6. Use of natural landscapes in the residential environment: Type of area, frequency of use, reasons for use, time, means of transport, proposals, notions, requests and preferences.
7. Social background of respondents.

This complex set of topics was chosen with a view to determining if and how the public green areas studied are perceived, used and exploited in recreational terms. A further aim was to study the ecological characteristics of the natural landscape components in the residential environment and analyse the main attitudes towards and social values attached to nature in the residential environment (FRIEDRICHS 1992, KROMREY 1991). Although the questionnaire was adapted to the particular features of each country, the general structure and questions remained much the same across countries. The survey included a total of 53 questions for Halle (Saale), 50 for San Pedro de la Paz and Tumbes and 56 for Cordova. The questions were verified by means of a trial survey of 20 people who were selected at random from each of the study sites.

The six research sites contain the same type of natural elements, although their layout and quantity vary in each area of the study. The communities of San Pedro de la Paz and El Brillante, both of which have detached houses, stand out for their variety of natural elements (household gardens, trees, wilderness), which far surpass the other study areas. There is a much greater abundance of “patches” of natural vegetation in the areas surrounding the residential neighbourhoods of Chile and Spain than in most of the study areas in Germany, thus enhancing the sample neighbourhoods. In contrast, there is a notable lack of natural spaces in the working-class neighbourhoods around Tumbes Park; a fact which appears to go hand in hand with the underprivileged situation of the residents who live there. In the neighbourhood of Santa Marina in Cordova urban vegetation is also scarce, although this is most likely due to historical, social and cultural factors.

Prior to conducting the survey, the interviewers visited the sample households to request the residents to take part in the survey. A sheet was then left at the entrance to the building with information on the institutions conducting the study, the interviewers and the objectives, contents and duration of the survey.

The survey was conducted using standardised questionnaires and the stratified random probabilistic sampling technique. The sample population was made up of residents over 18 years of age in each of the sample study sites.

CRITERION	DESCRIPTION	GROUPS OF QUESTIONS ON SURVEY	ROLE
Daily recreational needs	Interaction with urban nature should be available as an everyday occurrence. Citizens should be free to choose when to visit the spaces, throughout the week or throughout the year, without undue hindrance.	<ul style="list-style-type: none"> Availability of free time on weekdays Availability of free time on weekends Car owner Use of car Free time activities Holiday destination Owner of garden, plot or kitchen garden 	To observe if all members of the population have equal opportunities for recreation and use of nature.
Optimal use of green spaces	Access to urban nature should not be compromised by factors that reduce their accessibility. The quality, type, and quantity of vegetation and uses of the site will determine if use is optimal or not.	<ul style="list-style-type: none"> Enjoyment of nature Visits to urban green spaces Frequency of visits to urban green spaces Time spent in green spaces Problems in green spaces Assessment of green spaces 	To determine the quality of nature and what aspects users value most in green spaces.
Location and accessibility	The most crucial factor for access is that spaces be located within easy walking distance of user communities, ideally 5 minutes walking time.	<ul style="list-style-type: none"> Place where nature is observed Time spent travelling to site 	To determine whether or not the location of urban green spaces permits equal access by all members of the community.
Local identity with green spaces and quality of life	Local identity can often be defined by a certain landscape character which people cherish and which reinforce a sense of belonging due to cultural, historical or other ties.	<ul style="list-style-type: none"> Meaning of nature Protection of nature Investment in nature Participation in protecting nature Name of park normally visited Nature in the neighbourhood 	<ul style="list-style-type: none"> To ascertain the importance given to urban green spaces and the environmental awareness of users. Determine if differences exist between users with different social backgrounds.
Landscape equity and social inclusion	Those who wish to access urban nature should be able to do so regardless of age, gender, status, background or income. Adherence to considerations of access, location, site quality and management ensures that users feel satisfied with use. To ensure full social inclusion, it may be necessary to provide measures to promote use, including the removal of negative factors that dissuade use.	<ul style="list-style-type: none"> Age Employment situation Level of schooling Neighbourhood where user lives 	To determine if the use of nature is conditioned by social status or other factors.

Table 1 Urban nature and quality of urban life

The survey was conducted in a different manner in each of the countries depending on the culture of participation of the population, application time and available budget. The survey was conducted in Germany in 1998 (BREUSTE, BREUSTE 2003, BREUSTE et al. 2003). Participation in a extended representative questioning was voluntary and anonymous. Before distributing the questionnaires, the interviewers visited all of the households to ask the residents to participate in the survey. The survey, accompanied by an explanatory letter, was then left on bulletin boards located at the entrance to each of the buildings in the sample. The questionnaires were distributed in person and collected by the interviewers at the agreed time. Upon submission, questions were answered and help was given to complete the survey. A total of 1012 questionnaires were distributed, of which 491 were used for the study. These questionnaires comprised the total survey. A total of 258 people in Paulusviertel and 233 people from the 8Wk housing development of Silberhöhe participated in the survey.

The survey was conducted in Chile between 2001 and 2002 (BREUSTE et al. 2003). The study areas selected in Chile were: Laguna Grande, Los Arrayanes and Las Acacias of the town of San Pedro de la Paz and the neighbourhoods of Los Copihues, Nueva Los Lobos, Villa Badarán and Centinela Sur of the town of Talcahuano. The questionnaire was conducted in person by the interviewers. A group of survey takers with previous experience in survey methodology were trained in the use of a system to control and validate the surveys. The interviewers went door to door – according to a stratified sample by neighbourhood and household – in order to aid the respondents in completing the surveys. Of the 400 surveys submitted (200 per study site), 400 were completed, thus amounting to 100% of the submitted surveys.

The survey was conducted in Spain in of 2004. The surveys were delivered personally to the selected households. They were then collected at the time and date agreed upon by the respondents. In order to ensure that a greater number of surveys were submitted, the interviewers had to visit some households as many as three times. Of the 375 surveys distributed in El Brillante, a total of 120 were collected, while 111 surveys out of a total of 392 were returned in Santa Marina.

Research Areas	Year of investigation	Distributed Questionnaires	Collected Questionnaires
Paulusviertel	1989	402	258 (=64,2%)
Silberhöhe	1989	610	233 (=38,1%)
San Pedro de la Paz	2001	200	200 (= 100%)
Tumbes	2002	200	200 (= 100%)
El Brillante	2004	375	120 (= 32%)
Santa Marina	2004	392	111 (= 28,3%)

Table 2: Relation between distributed and collected questionnaires in the reach areas

The population of the six study areas was represented proportionally in the sample by age.

The study was chiefly exploratory in nature. Greatest emphasis was placed on the analysis of data in order to qualitatively examine the interaction between nature and citizens through their perceptions (PUDDIFOOT, 1996). The methodology was largely based on the work of AUSTIN, 2004 and STEWART et al., 2004 in which data is analysed in a fundamentally interpretive manner. However, version 12.0 of the SPSS software was employed in order to interpret the data in greater depth.

4. Results of the survey and comparative discussion

4.1 Urban nature in the residential areas

The quantity, quality and location of urban green spaces form part of the natural heritage of the city or neighbourhood in which they are found. These spaces are the pride and satisfaction of their users. When asked the question: “Are you satisfied with the natural amenities of your neighbourhood?”, the most frequent response in the six areas studied, regardless of the presence or absence of vegetation was: “I am satisfied” (Tumbes 49.5%, San Pedro de la Paz 51.5%, Silberhöhe 45.9%, Paulusviertel 55.8%, Santa Marina 51.3% and El Brillante 49.1%). Inhabitants’ level of satisfaction or dissatisfaction regarding the natural elements of their community is not wholly conditioned by the scarcity or abundance of green areas. Indeed, those who live in communities with little or no vegetation feel just as satisfied as those who reside in naturalised neighbourhoods. The El Brillante and Santa Marina neighbourhoods, both of which are in Spain, stand out from the neighbourhoods in the other countries studied for the larger number of respondents who stated that they are “very satisfied” with their natural surroundings. The large percentage of “satisfied” or “very satisfied” residents of El Brillante is to be expected given that this is the most naturalised neighbourhood of all those studied, even though nature is present here in the form of private gardens. In contrast, due to its historical architecture, Santa Marina is the neighbourhood with the least amount of public or street vegetation. However, many of the households have interior courtyards with abundant trees and plants, providing homeowners with numerous benefits on a par with those gained from public vegetation.

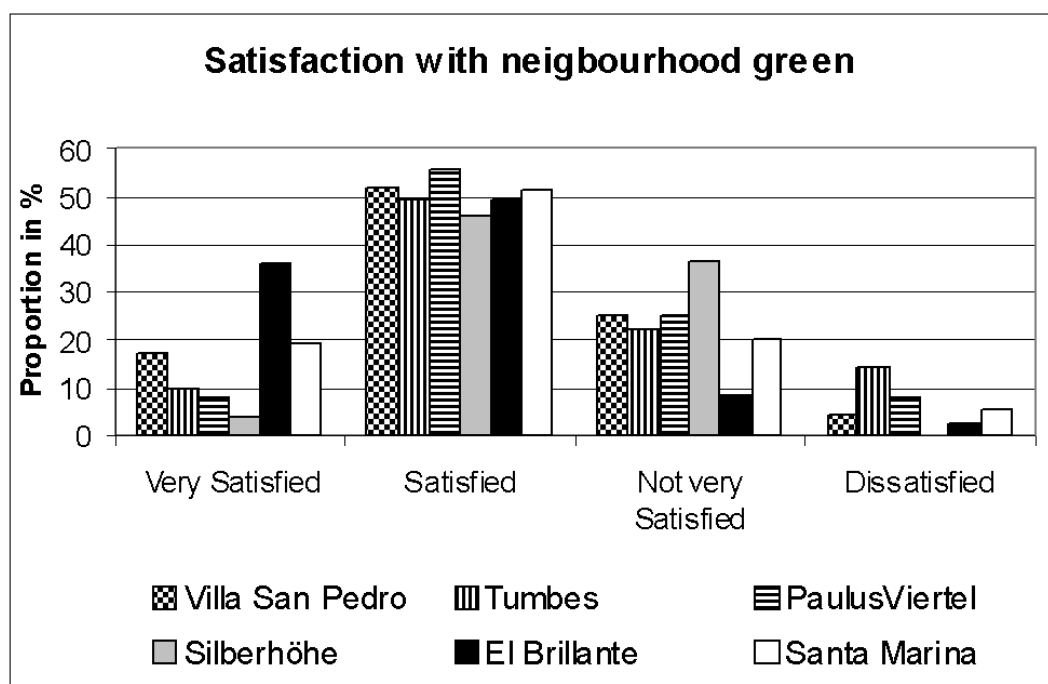


Figure 16: Satisfaction with neighbourhood green

4.2 General attitudes towards nature.

A positive attitude towards nature was found across the six study sites. In the German neighbourhoods, 68.2% of the sample population declared that “nature is important”, while 56.8% did so in Chile and 55.4% in Spain.

Those who declared themselves to be “nature lovers” or felt themselves to be “very connected” to nature represented 27.9% of the population in Germany, 39.8% in Chile and 39% in Spain. This suggests that the level of appreciation of nature (people who think that nature is important to them in addition to those who feel a close tie with it) is high in these countries (San Pedro de la Paz 95.6%, Tumbes 97.5%, Paulusviertel 94.4%, Silberhöhe 97.7%, El Brillante 92.5% and Santa Marina 96.3%).

This attitude is quite surprising as it suggests that nature is subject to a personal scale of values, which is in turn influenced by the problems and social background of each neighbourhood. In relative terms, however, the neighbourhoods that value nature the most are those which suffer from greater social problems and where urban vegetation is scarce (Tumbes, Silberhöhe and Santa Marina).

When inhabitants were asked “With respect to the investments made to protect nature, do you think that...?”, the most frequent response was “Nature has a high cost but it is worth investing in it” (San Pedro de la Paz 84%, Tumbes 77%, Paulusviertel 57.8%, Silberhöhe 54.9%, El Brillante 65% and Santa Marina 69%). Inhabitants of the Chilean study sites are more aware of the importance of protecting nature, even when this involves large investments. The affirmations made by the Chilean residents are striking given that Chile is the least developed country of those studied and has greater social problems and a lower per capita income.

This environmental awareness is also reflected in the level of participation by citizens in protecting nature. 27% of the citizens in San Pedro de la Paz, 21.5% in Tumbes, 24.4% in Paulusviertel, 16.3% in Silberhöhe, 31.6% in El Brillante and 44.1% in Santa Marina have participated at some time in activities to conserve nature. The Spanish study sites far surpass those of Germany and Chile in this regard, with the lower, middle-class neighbourhood of Santa Marina standing out most for its participation. On the other hand, the mid to high-income neighbourhoods of Chile and Germany participate more in protecting nature than in the low-income areas, perhaps due to the fact that they are in closer contact with nature and have more money and time to do it.

4.3 Use of urban nature: different views

The use of urban green spaces differs in each country depending upon the availability, accessibility and culture of use. In almost all of the study sites, the use of private green spaces (household gardens, land for weekend getaways) is the preferred choice for spending free time (San Pedro de la Paz 51.5%, Tumbes 28.5%, Paulusviertel 44.5%, Silberhöhe 41.7%, El Brillante 64.1% and Santa Marina 33.3%). It should come as no surprise, then, that the inhabitants of the neighbourhood with the largest number of private gardens, El Brillante, spend their free time in these spaces. Likewise, the inhabitants of Tumbes and Santa Marina, both of which have the least amount of private space, prefer other green areas to spend their free time.

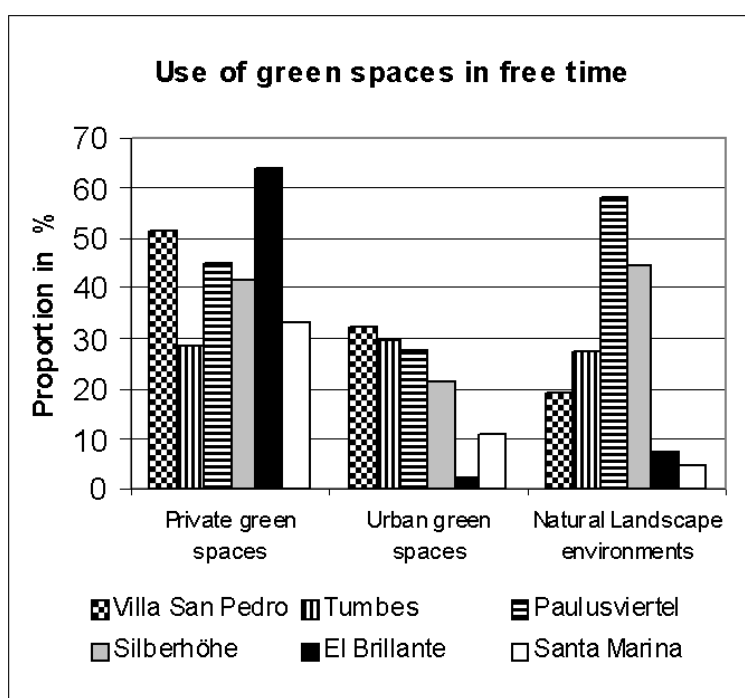


Figure 17: Use of urban nature in free time

In the study areas of Germany, the use of natural landscapes is significantly higher than in the neighbourhoods of the other countries (San Pedro de la Paz 19%, Tumbes 27.5%, Paulusviertel 58%, Silberhöhe 44.2%, El Brillante 7.5% and Santa Marina 4.5%).

These results shed some light on the land owning culture in the countries studied, although they are not conclusive given the easy access to the small social gardens known as “Allotment Gardens” that exist in Germany. These social green areas permit almost all of the inhabitants of Germany, regardless of their socio-economic status, to have access to some type of green space either within or outside the city; a situation that does not occur in Chile or Spain. This may explain why the urban green areas in Germany are used as a last resort to enjoy nature, unlike Spain or Chile where this is the second option chosen for undertaking free time activities.

When people have free time and choose to go out, the Germans and Chileans in particular prefer to “take a walk in the parks or public gardens near home” (San Pedro de la Paz 54%, Tumbes 61.5%, Paulusviertel 52.3%, Silberhöhe 49.8%, El Brillante 15% and Santa Marina 23.4%). In Spain, however, the most frequent response was to “take walks along streets with trees” (El Brillante 36.6% and Santa Marina 38.7%) followed by taking walks in nearby public parks.

The second option chosen by the well-to-do in Chile and Germany was to “take walks along streets with trees” (San Pedro de la Paz 47% and Paulusviertel 47.3%), while the underprivileged classes prefer to “take walks along any street in the neighbourhood” (Tumbes 32.5%, Silberhöhe 26.3%). This could be due to the absence of urban trees in these neighbourhoods. Very few respondents gave answers such as “Go bike riding”, “Walk the dog”, “Travel by car to parks” and “Other activities”.

A large percentage of the people in the areas studied spend their free time in contact with nature. Given the absence of private gardens, urban green spaces such as parks or tree-lined streets are of great importance. In some cases, these public areas are used by more than half of the local residents.

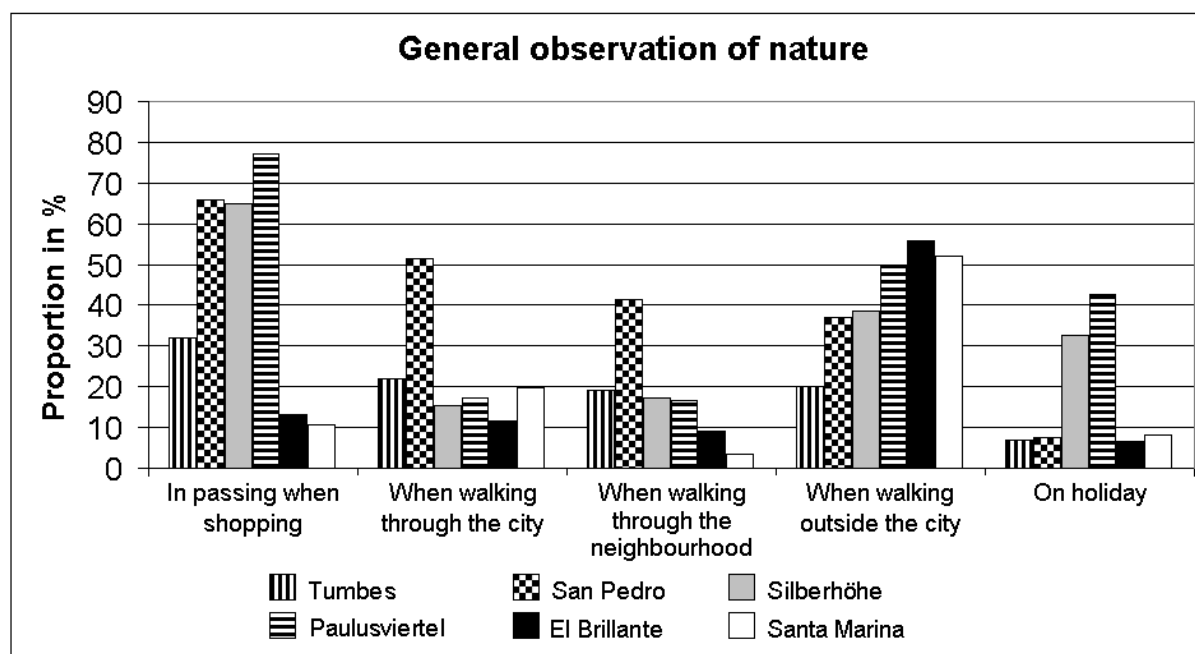


Figure 18: Preferred outdoor activities

The first choice of Germans and Chileans is to spend their free time in public spaces, while the Spanish prefer to take walks along tree-lined streets.

In both Chile and Germany, nature is largely observed in passing “when walking through the city to run errands” (San Pedro de la Paz 66%, Tumbes 32%, Paulusviertel 77.1%, Silberhöhe 64.8%).

Vegetation in the city or neighbourhood is perceived to be important solely in San Pedro de la Paz, where 51.5% of the population observes nature when walking through the city and 41.5% when taking a walk through the neighbourhood. In Germany, the second option for observing nature is “on holiday” (Paulusviertel 42.6%, Silberhöhe 32.6%) and in natural environments far from the city, “I observe nature in landscapes outside the city” (Paulusviertel 50%, Silberhöhe 38,6%). The Spanish behave differently from the Germans and Chileans. In the areas surveyed, residents largely observe nature when walking on the outskirts of the city (El Brillante 55.8%, Santa Marina 52.25%), followed at a great distance by observing nature in the city.

The Spanish have a different concept of nature than the Chileans or Germans. Given that the Spanish do not associate nature with urban settings, more than 50% stated that they observe nature outside the city and did not relate nature with urban parks or trees. It has to be noted that only 11.6% of the residents of El Brillante observe nature when taking walks through their neighbourhood, in spite of the fact that this is the most naturalised area of all those studied.

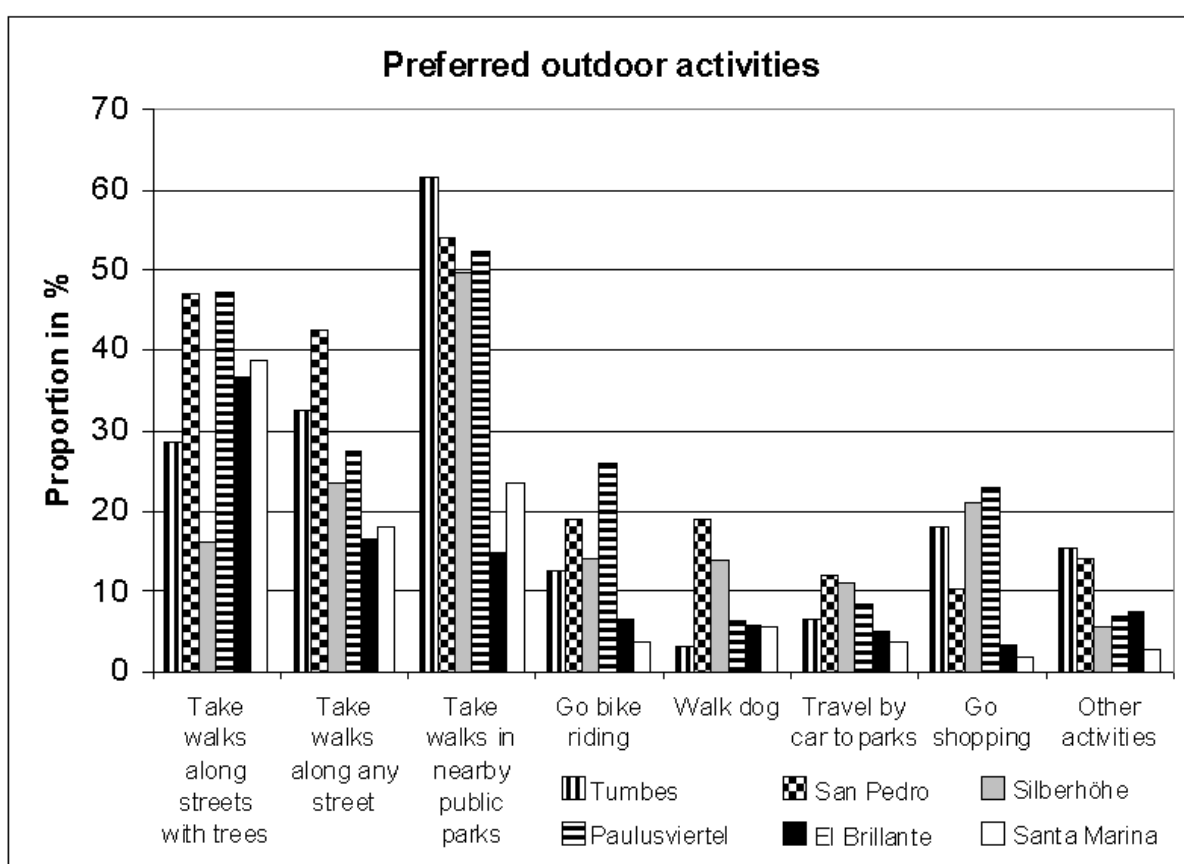


Figure 19: General observation of nature

As regards the frequency of use of urban parks, the most common response in the three countries was “once or twice a month” (Villa San Pedro 55%, Tumbes 49%, Paulusviertel 58.5%, Silberhöhe 59.2%, El Brillante 42.5% and Santa Marina 53.15%), followed by “I go frequently” (Villa San Pedro 38%, Tumbes 35%, Paulusviertel 22.5%, Silberhöhe 10.3%, El Brillante 35% and Santa Marina 42%).

The proximity of natural areas with respect to the study sites was reflected in the question “Time spent travelling to natural areas”. The majority responded that they spent “less than ten minutes” (Villa San Pedro 62.5%, Tumbes 67%, Paulusviertel 32.2%, Silberhöhe 42.9%, El Brillante 45.2% and Santa Marina 45.6%). On the other hand, the majority spends “more than an hour” in these spaces at each visit (Villa San Pedro 55%, Tumbes 47.5%, Paulusviertel 46.9%, Silberhöhe 42.9%, El Brillante 45.2% and Santa Marina 45.6%).

5. Discussion

Due to the small size of the sample used in the survey, the study results are purely exploratory in nature. However, this does not detract from the worthiness of the research results provided that they are interpreted in an appropriate manner and empirical generalisations are not made.

Although the objective of the study was not to conduct a statistical analysis nor identify group-dependent variables between users and nature, it permitted us to quantitatively explore the relationship between citizens and the urban nature that they use and draw the following conclusions.

Nature is not perceived in the same way by individuals from different socio-cultural backgrounds or from different countries. Nevertheless, there is a manifest need to have contact with and access to green areas both inside and outside the urban setting in order to achieve full personal development.

Although large environmental and social differences exist between the study areas, more than 90% of the Chilean, German and Spanish population sample declared that nature is important or very important in their lives. This demonstrates that contact with nature, in any of its many manifestations, is a fundamental pillar of individuals' well-being, regardless of their geographical, cultural or socioeconomic background.

Marked differences do not exist between low, mid or high-income neighbourhoods with different natural amenities in terms of the inhabitants' behaviour to nature and the importance given to it (see Fig. 19). These results contradict the studies by Hough (1998), who affirms that people who are frequently exposed to natural spaces are more environmentally aware than those who have little contact with nature.

Private green spaces (e.g. private gardens), including land used for recreational purposes, rather than public gardens or parks, is the first choice of Chilean, Spanish and German citizens who prefer to spend their free time in contact with nature. The second most preferred option in Germany is to spend free time in natural spaces outside the city, while the citizens of Chile and Spain prefer to spend their free time in urban parks. This supports the assumption that people demand different types of nature. The Spanish believe that private nature in the urban setting is more important to their physical and emotional well-being than the Germans, who prefer more wild environments.

The most frequent free-time urban activity in Chile and Germany is to take walks in public parks near the city, while the Spanish prefer to walk along tree-lined streets.

For the majority of middle-class Chileans and Germans and all of the Spaniards, urban trees are a determining factor when choosing where to go for a walk. However, trees are only important in neighbourhoods which have a large number of them. Indeed, residents from low-income neighbourhoods, where the absence of trees is notorious, prefer to take walks along any street over any other type of activity.

On the whole, Chileans and Germans do not usually observe nature at times specifically set aside for this purpose. Instead they observe nature "in passing" while doing other activities. As a second option, the Chileans observe nature when they take walks through their city or neighbourhood, while people in Germany prefer to observe nature in areas outside the city or while on holiday. In Spain, nature is observed outside the urban setting. The Spanish do not associate nature with city parks, tree-lined streets or other areas with patches of vegetation. The Spanish observe nature at given periods of time specifically devoted to this purpose and in areas removed from the city.

Socioeconomic status was shown to be a determining factor in the use of and preference for green spaces. Members of the higher income groups, regardless of the area studied, often opt for other alternatives when using nature; alternatives that are less accessible to the inhabitants of low-income neighbourhoods. These can be private gardens or only by car reachable nature sites (see Fig. 17). Most people prefer to use private rather than public green spaces. In both Germany and Spain little difference was found between areas with varying social backgrounds. In Germany this difference is offset by social policies which facilitate access by low-income people to small gardens known as "Allotment Gardens" within the city. In Spain, low-income people have access to green areas due to

the easy accessibility to plots of land on which illegal homes can be built. Neither of these situations occurs in Chile.

To conclude, it should be pointed out that nature and open urban spaces as elements of the urban landscape are key to improving the quality of life of city dwellers, regardless of their cultural or social status. Natural landscape elements in urban surroundings must be taken into account in urban planning policies to reflect the needs, economic possibilities and customs of the city's inhabitants. Urban nature is important in all of its manifestations, from private gardens, tree plantations and city parks to land used for recreational purposes in or near the city. This wide range of options permits users to select what is best for them and make nature a part of their daily lives.

The following is a summary of the general conclusions drawn from the study:

1. Nature plays an important role in all the urban societies studied, regardless of social status and nationality. Both Europeans and Latin Americans consider urban green areas to be an important aspect of urban culture.
2. People from all the study areas are highly interested in nature in general and the nature in their neighbourhood in particular.
3. The higher the social status, the larger the amount of private urban green areas. Lower-income areas in particular need to be compensated for this lack of private green space by making green areas more accessible to the population. Unfortunately, this is seldom the case.
4. On the whole, urban dwellers use different kinds of nature in their cities. The preference for specific types of nature depends on cultural background, accessibility and tradition, although social status can also play an important role.
5. Although the socioeconomic status of urban dwellers plays a role in their general free-time behaviour, there are certain nature-related outdoor activities that do not depend on this status, but instead reflect people's cultural status within society. Thus people's relationship to nature does not have to do with their socioeconomic status, but the culture shared by all the members of the society.
6. It is important that urban landscapes include green spaces in order to satisfy urban dwellers' need to be in contact with nature. This need must be reflected much more clearly and categorically in urban planning policies to ensure that cities are liveable and urban landscapes are attractive for people.

All the three countries can further use these results for improving their urban green planning. This could be in Germany, Spain and Chile more respect to social functions of urban green in neighbourhoods, reflecting the needs of the people. All countries have to develop a special strategic planning to include their natural green spaces in the outskirts and at the edges of the cities into their urban green planning concepts to add to the mostly small ornamental green of the inner cities more nature offers for the people. This includes also more environmental education to value all kind of urban and peri-urban nature and to make use of it for the urban dwellers.

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